Patent claims

1. A method for signal transmission via a radio interface in a radio communications system, which

- uses a subscriber separation method to distinguish between signals, with a radio channel being defined at least by a frequency band (B) and a connection-specific fine structure (c),

in which

- at least one radio channel is assigned for signal transmission between a first radio station (BS) and a second radio station (MS),
- at least one signal is transmitted via at least two transmission paths,
- at least one characteristic value (RXLEV, RXQUAL, ta, C/I) relating to the transmission conditions on the radio interface is determined for each transmission path,
- a control signal (stsig) is derived from a comparison of the mutually corresponding characteristic values (RXLEV, RXQUAL, ta, C/I), by means of which control signal (stsig) the transmission path is selected specifically for the radio channel for transmitting a subsequent signal, where in the situation where any difference between the characteristic values (RXLEV, RXQUAL, ta, C/I) does not exceed a predetermined threshold value, a transmission path is in each case selected on a periodically changing basis, so that at least two successive, decorrelated signals are transmitted via different transmission paths.

2. The method as claimed in claim 1, in which

- the signal is sent by the second radio station (MS) and is received via at least two antenna devices (A1, A2) of the first radio station (BS) using diversity reception,

- the characteristic values (RXLEV, RXQUAL, ta, C/I) are determined from the signal received by the respective antenna device (A1, A2), and
- the control signal (stsig) which is derived from the comparison of the mutually corresponding characteristic values (RXLEV, RXQUAL, ta, C/I) is used to actuate a switching device (UE) which switches a subsequent signal specifically for the radio channel to one of the antenna devices (A1, A2) of the first radio station (BS).

3. The method as claimed in claim 1, in which the signal is transmitted, separated in time, via in each case one transmission path.

4. The method as claimed in claim 3, in which

- the signal which is separated in time is sent by in each case one antenna device (A1, A2) of the first radio station (BS) and is received by the second radio station (MS),
- the characteristic values (RXLEV, RXQUAL, ta, C/I) are determined from the respectively received signal, and
- the control signal (stsig) is derived from the comparison of the mutually corresponding characteristic values (RXLEV, RXQUAL, ta, C/I) and is used to actuate a switching device (UE) which switches a subsequent signal specifically for the radio channel to one of the antenna devices (A1, A2) of the first radio station (BS).

5. The method as claimed in claim 4, in which the specific characteristic values (RXLEV, RXQUAL, ta, C/I) [lacuna] transmitted to the first radio station (BS), and the control signal (stsig) is derived from them.

6. The method as claimed in claim 4, in which the control signal (stsig) is derived in the second radio station (MS) and is transmitted to the first radio station (BS).

7. The method as claimed in claim 5 or 6, in which

the characteristic values (RXLEV, RXQUAL, ta, C/I) and the control signal (stsig) are transmitted using in-band signaling.

8. The method as claimed in a preceding claim, in which

in the situation where any difference between the specific and mutually corresponding characteristic values (RXLEV, RXQUAL, ta, C/I) does not exceed a predetermined threshold value, a transmission path is in each case selected on a periodically changing basis, so that at least two successive, decorrelated signals are transmitted via different transmission paths.

9. The method as claimed in a preceding claim, in which

the connection-specific fine structure is formed by a CDMA code (c).

10. The method as claimed in claim 9, in which

a TD/CDMA method is used as the subscriber separation method, with a radio channel being defined by a frequency band (B), a timeslot (ts) and a CDMA code.

11. The method as claimed in claim 10, in which

the signals are transmitted using a TDD method, in which the signals are transmitted from the first radio station (BS) to the second radio station (MS) and from the second radio station

(MS) to the first radio station (BS), separated in time, in one frequency band (B).

12. The method as claimed in claim 10 or 11, in which

at least two successive signals are transmitted with the timeslot (ts) being changed, with the timeslot (ts) which is used for transmission being changed periodically and in synchronism with the time protocol of the subscriber separation method.

13. The method as claimed in a preceding claim, in which

at least two successive signals are transmitted with the frequency band (B) being changed, with the frequency band (B) which is used for transmission being

changed periodically and in synchronism with the time protocol of the subscriber separation method.

14. The method as claimed in a preceding claim, in which

the transmitted signals are received in the first radio station (BS) and/or in the second radio station (MS) using a joint detection method.

15. The method as claimed in a preceding claim, in which a reception level, a bit error rate and/or a value proportional to the signal delay time (ta) between the first radio station (BS) and the second radio station (MS), and/or a signal-to-noise ratio is defined as the characteristic value (RXLEV, RXQUAL, ta, C/I).

16. A radio station (BS, MS) for signal transmission via a radio interface in a radio communications system, which

- uses a subscriber separation method to distinguish between signals, in which a radio channel is defined at least by a
  frequency band (B) and a connection-specific fine structure (c),

having

- at least one antenna device (A1, A2) for receiving and/or sending at least one signal which is transmitted via at least two transmission paths,
- an evaluation device (AW) for determining at least one characteristic value (RXLEV, RXQUAL, ta, C/I) relating to the transmission conditions on the radio interface for each transmission path,
- a control device (SE) for deriving a control signal (stsig) from a comparison of the mutually corresponding characteristic values (RXLEV, RXQUAL, ta, C/I), and from a comparison of any difference between the characteristic values (RXLEV, RXQUAL, ta C/I) with a predetermined threshold value, and
- a switching device (UE) which is actuated by the control signal (sig) and selects the transmission

path specifically for the radio channel for transmitting a subsequent signal, where, in the situation where the difference between the characteristic values (RXLEV, RXQUAL, ta, C/I) does not exceed the predetermined threshold value, the switching device (UE) in each case selecting a transmission path on a periodically changing basis, so that at least two successive, decorrelated signals are transmitted via different transmission paths.

17. The radio station (BS, MS) as claimed in claim 16,
which is designed as a base station in a mobile radio system.

18. The radio station (BS, MS) as claimed in claim 16,
which is designed as a mobile station in a mobile radio system.

Abstract

Method and radio station for signal transmission in a radio communications system

In the method for signal transmission via a radio interface in a radio communications system, at least one radio channel is assigned for signal transmission between a first and a second radio station, and at least one signal is transmitted via at least two transmission paths. At least one characteristic value relating to the transmission conditions on the radio interface is determined for each transmission path. A control signal is derived from a comparison of the mutually corresponding characteristic values, by means of which control signal the transmission path is selected specifically for the radio channel for transmitting a subsequent signal.

Figure 3

Figure captions:

nein = no
ja = yes